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CHAPTER 2

DESIGN FACTORS

2-1. Design Rationale. The plan formulation process will predict the number and size of boats which are expected to use the harbor during its project life. The benefits then can be estimated. Generally, several basin and entrance channel configurations, with cost estimates, will be needed to indicate the optimum plan. Each layout must accommodate the expected fleet and provide equal protection to make valid comparisons. If benefits exceed costs for these configurations, then the recommended site should be selected by the plan formulation process. This process considers initial cost, maintenance cost, and social and environmental aspects. If costs exceed benefits, a reduced basin size for fewer boats or stage construction could be considered.

2-2. Typical Project Elements. The following project features are normally the responsibility of the Corps:

- a. Entrance Channel. Channel connecting the basin with deep water.
- b. Breakwater. Bottom connected or floating structures which reduce the incident wave height to acceptable levels inside the basin.
- c. Access Channel. A channel which provides access from the entrance channel to the moorage area and turning basin.
- d. Turning Basin. Area provided for vessels to safely change directions. It is usually located at or near the upper end of the access channel. One or more turning areas may be provided for long access channels.
- e. Moorage or Anchorage Areas. These are normally the responsibility of the local sponsor for recreational craft; however, the Corps will provide these areas for commercial craft.
- f. Special Features. Special features for site-specific problems can also be included with the project design. The features could be wave absorbers, ice control measures, water quality improvement, shoaling reduction features, sand bypass systems, or erosion control structures.

2-3. Physical Data to be Evaluated. The design of a small boat harbor project will require an analysis and evaluation of information on the following:

- a. Weather.
 - (1) Wind
 - (2) Waves

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(3) Visibility (rain, smog, fog, snow)

(4) Ice

b. Site Characteristics.

(1) Currents (tidal, river, seiche, wave generated)

(2) Sediment movement or longshore drift

(3) Type of bottom (soft or hard)

(4) Water depths and water level fluctuations

(5) Obstructions (sunken vessels, abandoned structures, etc.)

(6) Existing bridge crossings (location, type clearance)

The factors listed above provide the basis for selecting the project design conditions. These design conditions must reflect weather and site conditions which are infrequently exceeded during the navigation season. Extreme weather conditions are to be evaluated and estimates of project damage presented.